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For: STATUS MONITORING OF A PLURALITY OF
IMAGE PROCESSING DEVICES

L E T T E R

Commissioner for Patents
P.O. Box 1450
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Sir:

Under the provisions of 35 U.S.C. § 119 and 37 C.F.R. § 1.55(a), the applicant(s) hereby claim(s) the right of priority based on the following application(s):

<u>Country</u>	<u>Application No.</u>	<u>Filed</u>
EUROPE	02079457.4	October 14, 2002

A certified copy of the above-noted application(s) is(are) attached hereto.

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Respectfully submitted,

BIRCH, STEWART, KOLASCH & BIRCH, LLP

By 

Joseph A. Kolasch, #22,463

JAK/smt
0142-0434P

Attachment(s)

P.O. Box 747
Falls Church, VA 22040-0747
(703) 205-8000



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Patentanmeldung Nr. Patent application No. Demande de brevet n°

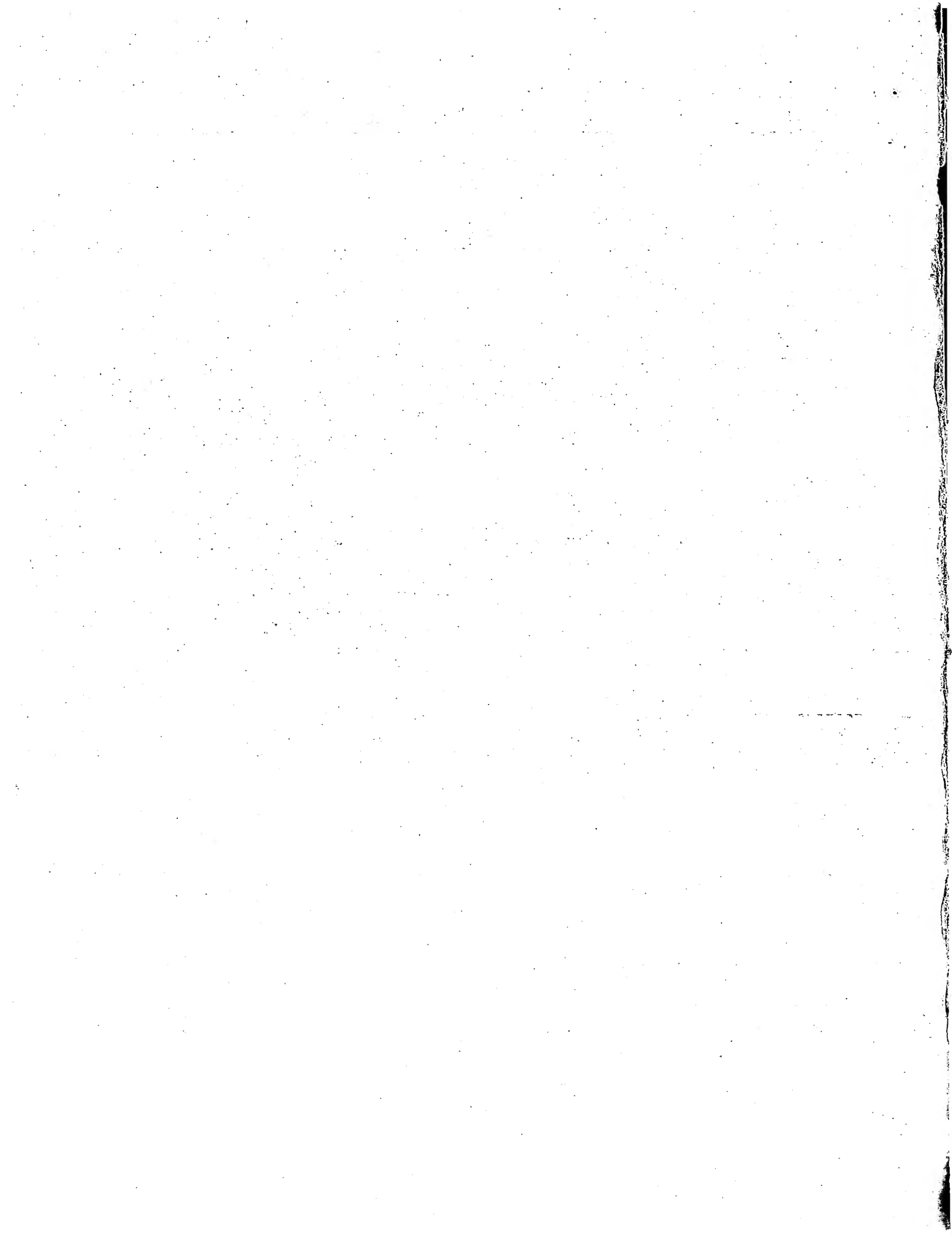
02079457.4

Der Präsident des Europäischen Patentamts;
Im Auftrag

For the President of the European Patent Office

Le Président de l'Office européen des brevets
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R C van Dijk





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Océ-Technologies B.V.
St. Urbanusweg 43
5914 CC Venlo
PAYS-BAS

Bezeichnung der Erfindung/Title of the invention/Titre de l'invention:
(Falls die Bezeichnung der Erfindung nicht angegeben ist, siehe Beschreibung.
If no title is shown please refer to the description.
Si aucun titre n'est indiqué se referer à la description.)

Status monitoring of a plurality of image processing devices

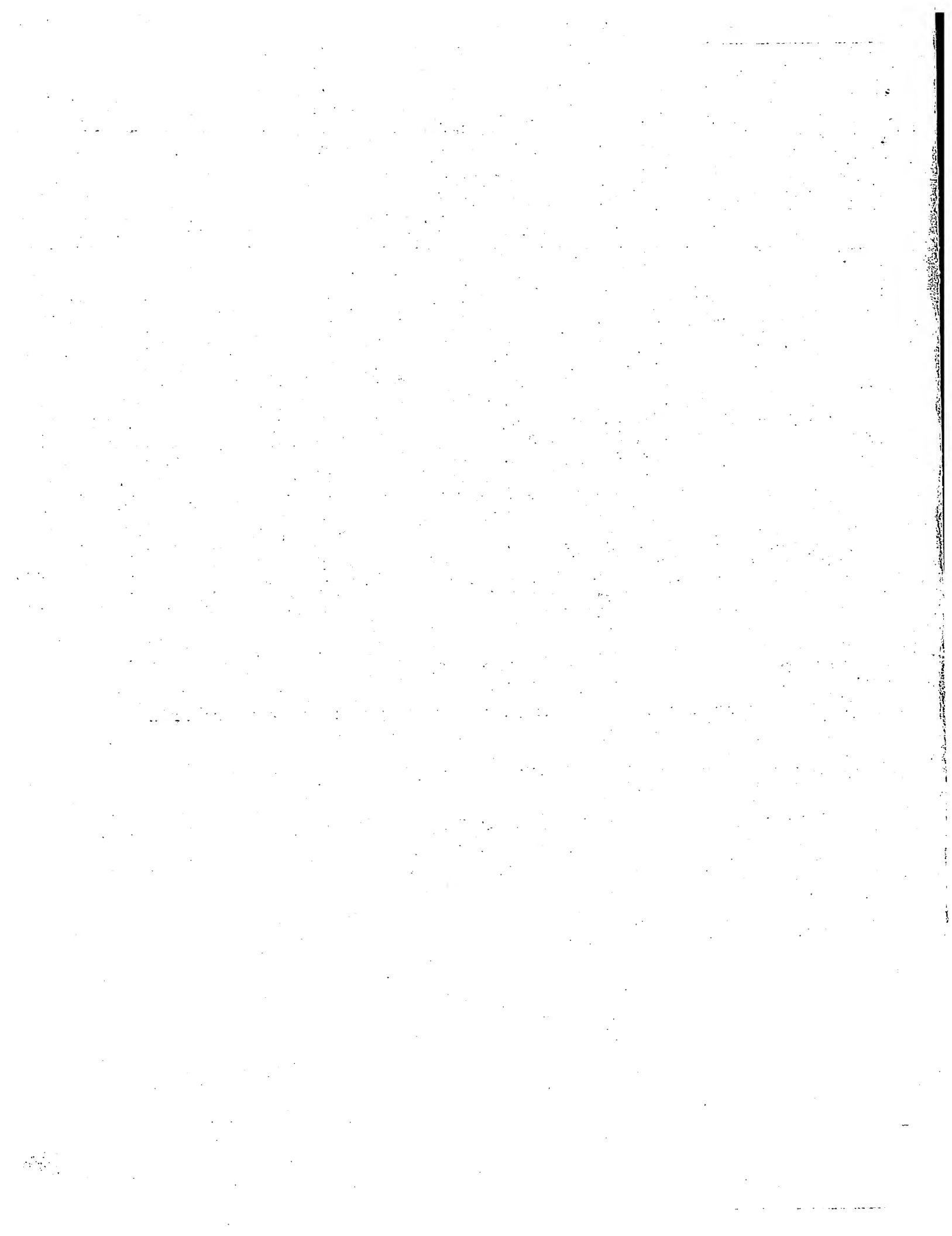
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Staat/Tag/Aktenzeichen/State/Date/File no./Pays/Date/Numéro de dépôt:

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Océ-Technologies B.V., of Venlo

Status monitoring of a plurality of image processing devices

5 The present invention relates to a method and a system for monitoring the operating status of a plurality of image processing devices located in a proximate environment, and to a portable terminal for monitoring the operating status of a plurality of image processing devices in a proximate environment.

The general term "image processing device" as used here includes printers, plotters, 10 scanners, copiers, fax machines online finishers, off-line finishers and combinations or variations thereof, i.e. "image processing" includes also merely handling documents on sheets of paper.

BACKGROUND ART

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US 5,398,257 discloses a copying machine including copying circuitry controlled by a copier processor. The copier processor gathers and generates status information for the copying machine and this status information is transmitted to a remote processor by a wireless transceiver. A transceiver processor may be used to analyze the status 20 information and control operation of the wireless transceiver. The wireless transceiver may also receive information and corrective action in response to the transmitted status information for use by the copier processor in controlling operation of the copying circuitry. A monitoring network is formed using a plurality of copying machines that send status information to a base processor through a base transceiver. The base processor 25 can initiate appropriate action in response to received status information.

US 5,822,221 discloses an office machine monitoring device that includes an interface circuit coupled to the logic circuit and the display circuit of the office machine. The interface circuit intercepts data from the logic circuit of the office machine while allowing 30 the display circuit of the office machine to receive the data. The data intercepted by the interface board is processed by a microcontroller unit, placed into a wireless message format, and sent to a monitoring base through a wireless transceiver unit. This office machine monitoring device allows to have an interface unit within the office machine to intercept data without affecting the operation of the office machine and to provide 35 monitoring of office machines without performing manual checks or establishing

expensive communication links to a remote host monitoring computer.

US 5,787,149 discloses a method and apparatus for managing remotely located document-producing machines by using cellular technology. The apparatus includes a central computer, a central cellular radio station, and a number of remote document-producing nodes. The central computer generates a copier management command directed towards a selected one of the remote document-producing nodes, and supplies this command to the central cellular radio station. This radio station then uses a central cellular radio to relay the copier management command to the selected remote copier node. Alternatively, in a remote document-producing node initiates a remote management operation by transmitting management data to the central cellular station.

The above described copier and network solutions allow avoiding the use of hardwire installation for the monitoring of copying machine status information and provide copying machines that implement a wireless transceiver for the transmission of status information. The copying machine status information can, however, only be received at a fixedly located centralized base processor.

US 5,701,548 discloses a copying system wherein operation modes of a copying machine are set using an IC card located at a distance from the copying machine. The IC card has: a transmitter for transmitting a signal that contains an identification code for identifying the IC card itself, an identification code for identifying a specific copying machine, and prestored operation mode setting information for the copying machine; a receiver for receiving a signal transmitted from the copying machine; a CPU for identifying the copying machine and its operating condition; and a display. The copying machine has a transmitter for transmitting a signal that contains an identification code for identifying the copying machine itself, an identification code for identifying the IC card, and information concerning the operating condition of the copying machine itself; a receiver for receiving a signal transmitted from the IC card; and a CPU for identifying the originating IC card and for setting the copying machine operation mode. When the IC card comes within a short distance from the specific copier, the copier takes on the operating mode stored in the IC card and transmits its operating condition to the IC card, which displays it.

The IC card can be inserted in an offline job commander for programming the IC card.

In a central reprographics department it is very important that the image processing devices will continue to operate. Paper jams, print jobs which need special inserts, empty paper trays and full finishers are examples of operating states in which the image processing device will stop operating and operator interaction is required immediately.

- 5 But the operator could be out of reach of the image processing device's audible or visible clues, or could be away from the central base processor.

There is therefore a need for an improved system for monitoring a plurality of image processing devices.

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DISCLOSURE OF THE INVENTION

- On this background, it is an object of the present invention to provide a method and a
15 system for monitoring the operating status of a plurality of image processing devices of the kind referred to initially, which is capable of continuously keeping a freely moving operator informed of the operating status of each of the plurality of image processing devices.

- This object is achieved by providing a method of monitoring operating status of a
20 plurality of image processing devices located in a proximate environment, comprising sending wireless signals incorporating operating status data for each of said image processing devices, receiving said wireless signals in at least one portable terminal, and presenting said status data to an operator of said portable terminal.

- Additionally, the object of the present invention is to provide a system for monitoring the
25 operating status of a plurality of image processing devices located in a proximate environment, comprising at least one transmitter connected to the plurality of image processing devices, said transmitter being provided with means for sending wireless signals incorporating operating status data for each of the image processing devices and at least one portable terminal provided with a receiver for receiving said wireless
30 signals, the portable terminal being provided with means for presenting said status data to an operator.

- The system may comprise a server connected to the plurality of image processing devices for collecting the operating status data and passing the operating status data on
35 to the transmitter, thus allowing a reduction in the number of transmitters.

Preferably, the server preprocesses the operating status data before passing the status data on to the transmitter, thus reducing the amount of data to be sent by the transmitter.

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The signal sent by the transmitter can be a radio frequency (RF) signal, preferably a low power RF signal and even more preferable, an RF signal as defined in the Bluetooth specification 1.0A, 1.0B or 1.1.

10 Alternatively, the signals sent by the transmitter are infrared (IR) signals, which is particularly advantageous because no license is required as for using RF signals. When the operator and the image processing devices are not all located within one room, repeaters could be used to transmit the signal to the other rooms.

15 Each of the image processing devices may be provided with a transmitter for sending wireless signals incorporating image processing device status data.

Each of the image processing devices and the portable terminal may be connected to a wireless network.

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In an embodiment of the invention, the status information is presented on a display of the portable terminal in the form of a general system status indication or a device status indication regarding a particular image processing device, the choice being made in accordance with a predetermined presentation scheme.

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In an alternative embodiment, an operator of the portable terminal may himself select status information regarding a particular image processing device, using operating elements provided on the terminal.

30 In a further embodiment, the device status information is presented in one of at least two operator-selectable presentation levels, including a first, global, level and a second, detailed, level, each level having an associated presentation format. At the global level, presentation includes simple graphical symbols, such as the well-known "smileys", such that the operator can have an indication of the status in a single glance.

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Device status information regarding a specific image processing device is automatically shown on the portable terminal, if an event occurs in that specific device, according to a predetermined priority scheme. High priority events, such as those events that impede operation of the device, e.g. a paper jam or an empty paper tray, are always shown, while events of a lower priority, such as events that hamper normal operation, but need not be remedied immediately, e.g. toner level low, are only shown when the operator carrying the portable terminal is in the neighbourhood of the device.

Of course, low priority events, that in no way hinder the operation of the device, are only shown when the operator expressly selects the status of that device.

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It is yet another object of the present invention to provide a portable terminal for use in the system of the invention.

By providing means to select the device for which the operating status should be displayed, a relatively small display as typically used in portable devices is sufficient to represent the status data of an image processing device efficiently.

In order to warn the operator, the portable terminal may comprise means for producing a visual and/or audio and/or vibration alert.

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The portable terminal may be provided with a color display, whereby the status of a selected image processing device is displayed as a color coded graphical icon.

Further objects, features, advantages and properties of the system for monitoring the operating status of a plurality of image processing devices located in a proximate environment, and the portable terminal for monitoring the operating status of a plurality of image processing devices located in a proximate environment according to the invention will become apparent from the detailed description.

30 BRIEF DESCRIPTION OF THE DRAWINGS

In the following detailed portion of the present description, the invention will be explained in more detail with reference to the exemplary embodiments shown in the drawings, in which

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Fig. 1 is a diagrammatic representation of a system for controlling the operating status of a plurality of image processing devices,

Fig. 2 is a detailed view on a portable terminal in a first preferred embodiment according to the invention,

5 Fig. 2a is a diagrammatic representation of the electronic components of the portable terminal,

Fig. 2b, is a cut open view on the rotary ring and associated bearing and switches,

Fig. 2c, shows a detail of a wheel used to pick up angular movements of the rotary disk,

10 Fig. 3.1 to Fig. 3.12 show the content of display of the portable terminal in different statuses of the display,

Fig. 4 is a second preferred embodiment of a portable terminal according to the invention,

Fig. 5 shows a display that uses graphical icons, and

Fig. 6 shows examples of status-describing icons ("smileys").

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DETAILED DESCRIPTION

The general term "image processing device" as used here includes printers, plotters, scanners, copiers, fax machines online finishers, off-line finishers and combinations or
20 variations thereof, i.e. "image processing" includes also merely handling documents on sheets of paper.

With reference to Fig. 1, a plurality of image processing devices in a centralized reprographic department is shown. In this embodiment, three copiers 10, two printers
25 11, one scanner 12 and one fax 13 are all connected to a local area network. Each of these devices is capable of transmitting their operating status via a network card to an address in the network. A server 20 in the form of a PC is connected to the network and a wireless transmitter 22. The image processing devices 10,11,12,13 send their operating status to the server at regular intervals, either on their own initiative or upon
30 being polled, and without delay in case of an error. The server processes the status information into an appropriate code for wireless transmission that includes information uniquely identifying the image processing devices 10,11,12,13. The transmitter 22 may be a radio frequency (RF) transmitter using a low intensity signal, such as in accordance with a Bluetooth standard. Alternatively, the transmitter may use more intensive RF
35 signals such as defined in the IEEE 802.11a or IEEE 802.11b wireless LAN standard.

The transmitter 22 may alternatively be of the type that sends infrared (IR) signals incorporating the operating status data. Preferably, the IrDA standard is used for the IR signals.

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The image devices are thus all in a proximate environment, i.e. in an environment such as a centralized reprographic department, in which a plurality of these type of devices are located within one building or within one building complex. The image processing devices could all be located in one single room, but they could also be spread over

10 several rooms, floors or wings of the building or building complex.

A portable terminal 30 receives the signals sent by the transmitter 22 and is used to present the operating status data of the different image processing devices to a freely moving operator. The portable terminal 30 is provided with a memory that is preferably

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of a permanent nature, and registers each of the image processing devices in its proximate environment by storing registration data for each of the image processing devices.

With reference to Fig. 2, according to a first preferred embodiment the portable terminal

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30 comprises a housing 31 and is provided with a display 32 and a rotary ring 35. The display is a color display capable of showing text and graphical objects. Further, with reference to Fig. 2a a processor 38, a memory 45, a loudspeaker 43 arranged under slots 59 for producing audible alerts and a vibrator 40 for producing vibration alerts are provided. The terminal also comprises a transceiver 39 of a type that matches the

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respective type of transmitter described above, i.e. an RF or IR transceiver. Power is supplied by a power source 41 in the form of rechargeable batteries, preferably provided with an induction charger (not shown). A block 43, representing the switches and sensors for user input is like the other electronic components 32,39,40,41 and 42 connected to processor 38 that controls the operation of the portable terminal 30.

30

The display 32 includes in two sections:

- section 34 is used to display an arc-shaped array of objects representing individual image processing devices, preferably in the form of graphical icons,
- section 33 is used for displaying status and menu information.

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The rotary ring 35 protrudes from both side surfaces of the housing 31 and is made of an elastically deformable material. As best shown in Fig 2b, the rotary ring is guided by a disk 55 provided with circumferentially spaced bearing blocks 63 made of a low friction material such a nylon or teflon, or other suitable guiding elements. The disk is slidably
5 guided by a slit 60 that engages a pin 61 connected to the frame of the portable terminal. This construction allows the operator to slide the rotary ring sideways towards a switch 57 to actuate the latter. A spring located in the slit 60 urges the disk 55 away from the switch 57.

10 As best shown in Fig 2c, a wheel 64 connected to an angular displacement detector (not shown) is arranged be in frictional contact with the side surface of the rotary ring 35. The wheel 64 rotates, be it a factor faster, when the rotary ring is turned. The signal of the angular displacement sensor is sent to the processor 38. The side surface of the ring is provided with recesses 66 that form arresting positions for the rotary ring 35.

15 A first pressure switch 36 is located in a recess of disk 55 close to the radially inner surface of the rotary ring 35 on one side of the portable terminal. A second pressure switch 36' is located in a recess of disk 55 close to the radially inner surface of the rotary ring 35 on the opposite side of the portable terminal. When an operator presses
20 on the ring at the position of a switch 36, 36', it deforms and the corresponding switch is activated.

In this way, the rotary ring 35 functions as a plurality of buttons for operator interaction with the portable terminal 30.

25 Pressing both "button" sections of the rotary ring 35 for a longer period, preferably longer than 1.5 seconds, is interpreted as a command to switch the terminal on and off. After turning the portable terminal on, the display is activated and takes the state as shown in Fig. 3.1, with an array or list of graphical icons representing image processing devices displayed in a scrollable format in section 34 and general information displayed
30 in section 33, normally showing an icon indicating that all image processing devices are functioning properly in the form of a glyph, such as a happy blue smiley 70. When errors or disturbances have occurred, a smiley with a less happy expression and a changed color (red) is displayed. Matters needing attention at some point, but which do not require immediate attention are indicated by a green smiley with the appropriate facial
35 expression, i.e. sad (miserable) or screaming for attention. Examples of such

expressions are shown in Fig. 6.

By turning the rotary ring 35, the operator can scroll through lists or other arrays.

Pressing a single button at a time, i.e. one of the side sections of the rotary ring, selects a highlighted or marked item. Depressing the side sections simultaneously for a short
5 period, i.e. less than 1 second, serves to return to the previous state or screen.

In the display section 34, an array of icons is displayed, forming in this example a list of the image processing devices for which the status is monitored: Terminal (T1), Scanners (S1, S2), Printers (P1, P2), Faxes (F1), Copiers (C1, C2, C3, C4) and the total system
10 (All). T1 is the portable terminal 30 itself. Thus, a different graphical icon is assigned to each image processing device, the total system and the portable terminal itself. The icons may have the form of acronyms (such as shown in Fig. 3.1), but may also have a graphical appearance resembling the particular device, as is shown in Fig. 5.

A static marker is provided on in the form of a selection loop 44, indicating the currently
15 selected device.

By sliding the rotary ring 35 sideways, thereby actuating the switch 57, the array of icons is activated. Once activated, the array of icons can be scrolled by turning the rotary ring 35.

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The software controlling the user interface is programmed to scroll the array of icons in the same direction as the rotary ring 35. The software may also be programmed such that the movement of the array of icons is proportional to the movement of the rotary ring 35. Preferably, the software is programmed such that the movement of the array of
25 icons coincides with the movement of the rotary ring 35 in a manner that gives the operator the impression that the array of icons is mechanically connected to the rotary ring 35 because they move in unison.

When the operator has scrolled the array so that the appropriate graphical icon is
30 located in the loop 44, displaying the status of the corresponding device is selected by pressing any of the "button" sections of the rotary ring 35, upon which the display 32 turns to the state as shown in Fig. 3.2. In this example, Printer 2 has been selected.

The upper part of section 33 of the display 32 shows a happy smiley since the selected
35 device is functioning properly. Below the smiley, the text "Printer 2" is displayed.

In the bottom part of section 33 the selectable menu items "Status Details" and "Queued jobs" are displayed. One of the selectable items is highlighted, e.g. by using a different color for the selected item or by underlining. Turning the rotary ring 35 scrolls through the "list" of selectable menu items. The highlighted menu item is selected by pressing any of the "button" sections of the ring.

When "Status Details" is selected in the state as shown in Fig. 3.2, the display 32 turns to the state as shown in Fig. 3.3. The upper part of section 33 displays the text "Printer 2". Below this text a list with status information is displayed, in this example:

Status: Printing
2000 Prints Single Sided
Job Progress: 28%

Since the list of information items is too long to be completely shown on the display, further items can be "scrolled" into the display area by turning the rotary ring 35 without displacing it in the way that it would activate switch 57 (Fig. 2b). Fig. 3.5 shows the display screen after such scrolling. In the given example, it now reads:

Job Progress: 28%
Finisher: 10%
Paper Tray 1: 50%
Paper Tray2: 100%

The bottom of display section 33 shows the selectable menu item "Job Details", which brings the display to the status shown in Fig. 3.4. This display status can also be reached by selecting the menu item "Queued Jobs" in the display status shown in Fig. 3.2.

Shortly pressing both "button" sections of the rotary ring 35 at the same time brings the display to the status as shown in Fig 3.2. Once again pressing both sections brings the display in the state as shown in Fig. 3.1.

In the display status as shown in Fig. 3.4, Section 33 lists the details of the current job such as: "Machine", "Status", "Job Nr.", "Client", "Page", and "Time remaining". In the bottom part of section 33 the selectable menu items "Next job" and "Previous job" are shown. Selecting "Next job" will display the details of the next job in the print queue, just as selecting "Previous job" will display the details of the job last finished. Again, pressing

both "button" sections of the rotary ring 35 at the same time will bring the display in the status as shown in Fig. 3.2.

Turning the rotary ring 35 clockwise without activating switch 57 scrolls the array of icons in section 34 in the same direction, and vice versa. Preferably, the rotary ring 35 is provided with arresting positions in the form of "clicks", whereby each "click" corresponds to a next step in the scrolled array or list, i.e. one click selects the next graphical item in the loop 38. Turning the rotary ring 35 two "clicks" clockwise and selecting the graphical item assigned to copier 1, which is now located in the selection loop 44, brings the display from the state shown in Fig. 3.1. to the state as shown in Fig. 3.6.

Errors, such as paper jams, and other disturbances that need immediate attention are displayed with priority. Such events include paper jams, empty paper trays, low cooling liquid, full finishers, out of staples, toner empty, special insert needed, special paper needed, etc. These alerts are displayed immediately by showing a red and sad or even screaming smiley in display section 33, the specific expression being selected in dependence on the seriousness of the situation.

Some alerts that do not require immediate attention such as a low toner or low paper level in paper trays, are displayed in section 33 with a lower priority expression. These alerts are only displayed if the operator is in the vicinity of the image processing device in question, and with a green neutral smiley signaling that attention is needed, but not immediately. When the alert becomes more serious, the smiley expression may be changed into a more alarming one.

A paper jam is a serious error requiring immediate operator action. When, for example, a paper jam has occurred on printer 1, the display turns to the state as shown in Fig. 3.7, and in accordance with operator selectable settings, also an audible and/or vibration alarm is issued.

The upper part of section 33 now shows a sad and red smiley. Below the smiley, the text "Error: Paper jam" in large red letters is displayed. There below the text "Printer 1" is displayed. At the bottom of section 33 the selectable menu items "OK", "Details" and "Postpone" are displayed.

- Selecting "OK" will acknowledge the alert and bring the display 32 to the state as shown in Fig. 3.11, in which the glyph is an unhappy smiley, but the error message has disappeared. The operator indicates by this selection that immediate repair action will be taken. Once the image processing device in question registers that the repair has been carried out it sends a signal to the portable terminal to turn to the status as in Fig. 3.1 with a happy smiley. The registration of the repair is part of the self check of the image processing device after all doors and covers are closed.
- 10 Selecting "Details" in the display shown in Fig. 3.7, brings the display to the state as shown in Fig. 3.8. Section 33 shows in the upper area the text "Printer 1". There below a detailed error message is shown, in the present example: "Error J14, paper jam top feeder". In the lower part of section 33 the selectable menu items "Instructions" and "OK" are displayed.
- 15 Selecting "instructions" brings the display to the state as shown in Fig. 3.9. The upper part of section 33 shows the text "printer 1". There below the steps needed to be taken to resolve the problem are listed in a scrollable list. In the present example, the list comprises "Open cover 1", "Move handle 4 anti-clockwise", "Remove stuck sheet" and
- 20 "close cover 1". If the list of instructions is too long to be completely displayed on the display 32, it may be scrolled by turning the rotary ring 35. Informative pictures may also be shown on the display 32.
- At the bottom part of display section 33 the selectable menu item "OK" is displayed,
- 25 which when selected brings the display to the state as shown in Fig. 3.11, in which the portable terminal returns to its initial setting before the paper jam occurred, that is, the state shown in Fig. 3.2 reporting the status of printer 2. However, it also shows a red unhappy smiley icon in the upper right hand corner of the display section 33 as a warning that one of the other devices has an error and the terminal is waiting for a
- 30 signal that the repair has been carried out,
- When "Postpone" is selected in the state of the display 32 as shown in Fig. 3.7, the display 32 turns to the state as shown in Fig. 3.10. The lower part of section 33 displays the confirmation message "Postponed 10 min", and the display will return to the state as
- 35 shown in Fig 3.11. After 10 minutes, or any other adjustable time period, the alert is

repeated and the display will turn to the state shown in Fig. 3.7 again.

Selecting "T1", i.e. the portable terminal itself from the movable array of objects brings the display to the status as shown in Fig. 3.12. Section 33 shows a scrollable list of
5 selectable menu items comprising, in this example, "Alerts", "Devices list", "User interface", "Colors", "Postpone time", "Language settings" and "Predetermined distance" (the last two items not shown). Scrolling the list with the rotary ring 35 highlights the selectable menu items one after another and pressing either the lower or upper button selects the highlighted menu item. The operation of carrying out changes to the settings
10 is not shown here in detail and will be apparent to the skilled reader.

With reference to Fig. 4 an alternative embodiment of the portable terminal 30 is shown. The display 32 has been adapted to display in section 34 a straight array with objects representing the image processing devices in section 34. Section 33 displays general
15 information, operating status information and selectable menu items.

The rotary ring 35 has been replaced by a slide switch 50. The slide switch 50 can be manipulated by the operator to slide upwards and downwards in the direction of the arrow 51. The slide switch 50 can be pressed in the direction of arrow 52 for selection
20 purposes. The slide switch 50 is resiliently biased to take a neutral position in which it is in the middle of its translative range in the direction of arrow 51 and outwards at the end of its translative range in the direction of arrow 52. Section 33 of the display 32 is normally active, and sliding the slide switch 50 upwards results in the array of objects to scroll upwards and sliding the switch downwards results in the array to scroll
25 downwards. Moving the slide switch 50 in the direction 51 while keeping it depressed results in scrolling through the image devices, and releasing the slide switch selects the device currently present in the selection loop 44. Section 33 then becomes active, and shows the status information as described further above. The software can be programmed such that one upward movement of the slide switch 50 moves the array of
30 objects upwards by one object so that the next object in the array is placed in the selection loop 44.

The use of a display with in which graphical icons are used instead of acronyms is shown in Fig. 5. The movable array thus comprises different graphical icons. A
35 particular graphical icon is assigned to each type of image processing device, e.g.

printers are assigned the icon that is generally used for this purpose in PC software, a photocopiers are assigned a graphical icon resembling a photocopier, etc. The particular image processing device is further identified by a number displayed with the graphical icon. Also, status icons may be combined with the device icons to give the operator a first indication of the status of all devices shown on the display. Examples of such status icons are a red cross for unavailable devices, an hour glass for devices temporarily out of service.

When a new image processing device is added to the population of devices monitored with the aid of the portable terminal, its particulars are registered in the control program of the server 20 (Fig. 1) by a service engineer, or it may present itself to the server automatically. The server 20 then includes the new device in its status monitoring service and transmits installation data to the portable terminal 30, such that it may register the new device and add it to the list of devices in display section 34 and related monitoring service.

Also, when an image processing device is removed from the population of devices, it is deleted from the monitoring service in the server 20. In that case, the server 20 sends a signal to the portable terminal 30 to delete the device from its display and service.

In the description above, the monitoring service is for the greater part implemented in the server 20 (Fig. 1), and the portable terminal simply operates as a user interface to the monitoring service in the server 20. Such an implementation has the advantage that data traffic between the server 20 and the portable terminal 30 is minimized.

However, it would also be possible to implement the monitoring service in the portable terminal and use the server 20 only for collecting status data of the monitored devices.

It would also be possible to do without the server 20 and include a wireless transmitter into each of the devices. The devices would then themselves send their status data to the portable terminal, that would include a monitoring service for processing the status data of the devices. In that case, the control program of the portable terminal is also provided with a registering service to register all devices to be monitored.

While the preferred embodiments of the devices and methods have been described in reference to the environment in which they were developed, they are merely illustrative

of the principles of the invention. Other embodiments and configurations may be devised without departing from the scope of the appended claims.

CLAIMS

1. A method of monitoring operating status of a plurality of image processing devices located in a proximate environment, comprising
- 5 sending wireless signals incorporating operating status data for each of said image processing devices,
- receiving said wireless signals in at least one portable terminal, and
- presenting said status data to an operator of said portable terminal.
- 10 2. The method of claim 1, wherein
- a server is connected to said plurality of image processing devices for collecting said operating status data, and passes said operating status data to at least one transmitter for sending said data.
- 15 3. The method of claim 1, wherein
- each of said image processing devices is provided with a transmitter for sending wireless signals incorporating image processing device status data, and wherein
- said portable terminal collects status data for all of the image processing devices.
- 20 4. The method of claim 1, wherein
- said portable terminal presents a general system status indication or a device status indication regarding a particular image processing device, in accordance with a predetermined presentation scheme.
- 25 5. The method of claim 1, wherein
- said portable terminal presents a device status indication regarding a particular image processing device upon selection made using operating elements provided on said terminal.
- 30 6. The method of claim 1, wherein
- device status information is presented on said portable terminal in one of at least two operator-selectable presentation levels, including a first, global, level and a second, detailed, level.
- 35 7. The method of claim 6, wherein

each of said presentation levels has an associated presentation format.

8. The method of claim 7, wherein

the presentation format associated with the first presentation level includes simple
5 graphical symbols.

9. The method of claim 4, wherein

said predetermined presentation scheme is based on a predetermined priority
scheme for events occurring in a device.

10

10. The method of claim 9, wherein

said portable terminal is made to always present a device status indication
regarding a particular image processing device, when in that device an event having a
high priority occurs.

15

11. The method of claim 9, wherein

said portable terminal is made to conditionally present a device status indication
regarding a particular image processing device, when in that device an event having a
middle priority occurs,

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wherein "conditionally presenting" means that said device status indication is only
presented when the portable terminal is within a predetermined distance from said
particular image processing device.

25

12. The method of claim 10, wherein an event impeding operation of a device has a high
priority.

13. The method of claim 11, wherein an event hampering normal operation of a device,
but not requiring immediate attention, has a middle priority.

30

14. The method of claim 10, wherein

said presenting a device status indication in connection with an event having a
high priority includes an audible and/or vibrational alarm.

35

15. The method of claim 10 or claim 11, wherein

said portable terminal, when it presents a device status indication regarding a

18

particular image processing device in connection with an event having a high or middle priority, prompts an operator for a response, including at least an acknowledgement and a command to postpone that particular status presentation to a predetermined later time.

5

16. The method of claim 10 or claim 11, including

displaying, upon request of an operator through operating means on the portable terminal and in connection with an event having high or middle priority, service guidance information on said portable terminal.

10

17. A system for monitoring the operating status of a plurality of image processing devices located in a proximate environment, comprising

at least one transmitter connected to said plurality of image processing devices, said transmitter being provided with means for sending wireless signals incorporating operating status data for each of said image processing devices and

15

at least one portable terminal provided with a receiver for receiving said wireless signals, said portable terminal being provided with display means for presenting said status data to an operator.

20

18. A system according to claim 17, comprising

a server connected to said plurality of image processing devices for collecting said operating status data and passing said operating status data onto said at least one transmitter.

25

19. A system according to claim 17, in which

each of said image processing devices is provided with a transmitter for sending wireless signals incorporating image processing device status data and

said portable terminal is provided with means for collecting the status data of all of the image processing devices.

30

20. A system according to any of claims 17 to 19, in which each of said image processing devices and said portable terminal are connected to a wireless network.

21. A system according to claim 17, in which said signals are RF or IR signals.

35

22. A system according to claim 17, including

a presentation module for analyzing said operating status data of said image processing devices and for presenting on the display of the portable terminal a general system status indication or a device status indication regarding a particular image processing device, in accordance with a predetermined presentation scheme.

23. A system according to claim 17, wherein

said portable terminal is provided with selection means for selecting a particular device, and wherein

said presentation module is connected to said selection means for presenting on the display of the portable terminal a device status indication regarding the selected particular image processing device.

24. A system according to claim 17, wherein

said presentation module is adapted to display device status information on the display of said portable terminal in one of at least two operator-selectable presentation levels, including a first, global, level and a second, detailed, level, each of said presentation levels having an associated presentation format.

25. A system according to claim 22, wherein

said presentation module is adapted to display a device status indication regarding a particular image processing device, when in that device an event impeding operation of the device occurs.

26. A system according to claim 22, further including

a distance-sensing module for determining the distance between the portable terminal and at least one of the image processing devices,

wherein

said presentation module is adapted to conditionally display a device status indication regarding a particular image processing device, when in that device an event hampering normal operation of a device, but not requiring immediate attention, occurs, wherein "conditionally displaying" means that said device status indication is only displayed when the portable terminal is within a predetermined distance from said particular image processing device.

20

27. A system according to claim 17, wherein the portable terminal is provided with means for generating an audible and/or vibrational alarm.

28. A portable terminal according to any one of claims 17 to 27.

ABSTRACT**Status monitoring of a plurality of image processing devices**

The invention relates to a system for monitoring the operating status of a plurality of image processing devices located in a proximate environment. According to the invention, the system for monitoring the operating status of a plurality of image processing devices located in a proximate environment, comprises at least one transmitter connected to the plurality of image processing devices. The transmitter is provided with a transmitter for sending wireless signals incorporating operating status data for each of said image processing devices and comprises at least one portable terminal provided with a receiver for receiving the wireless signals. The portable terminal is provided with a display for presenting the status data to an operator.

(Fig. 1)

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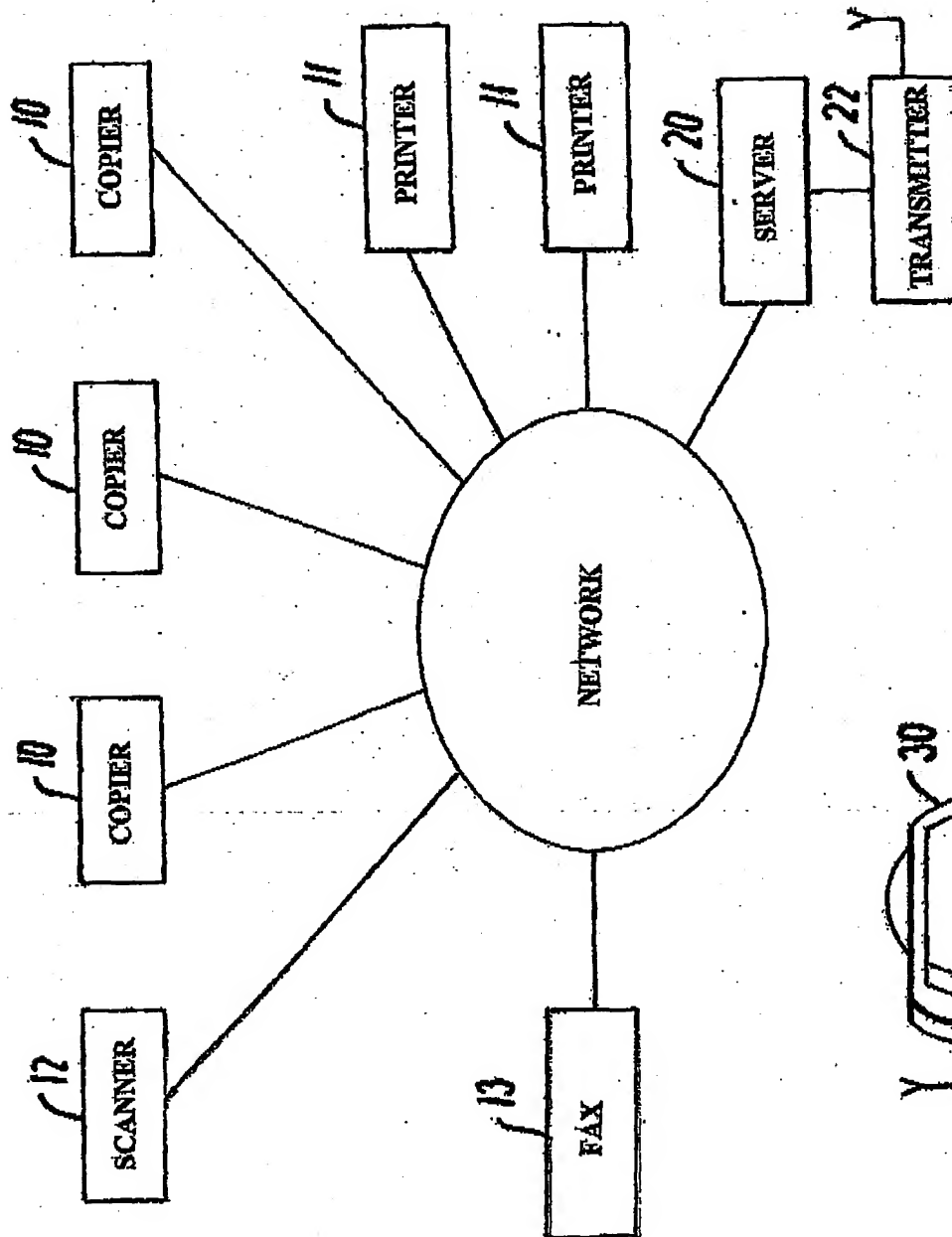


FIG. 1

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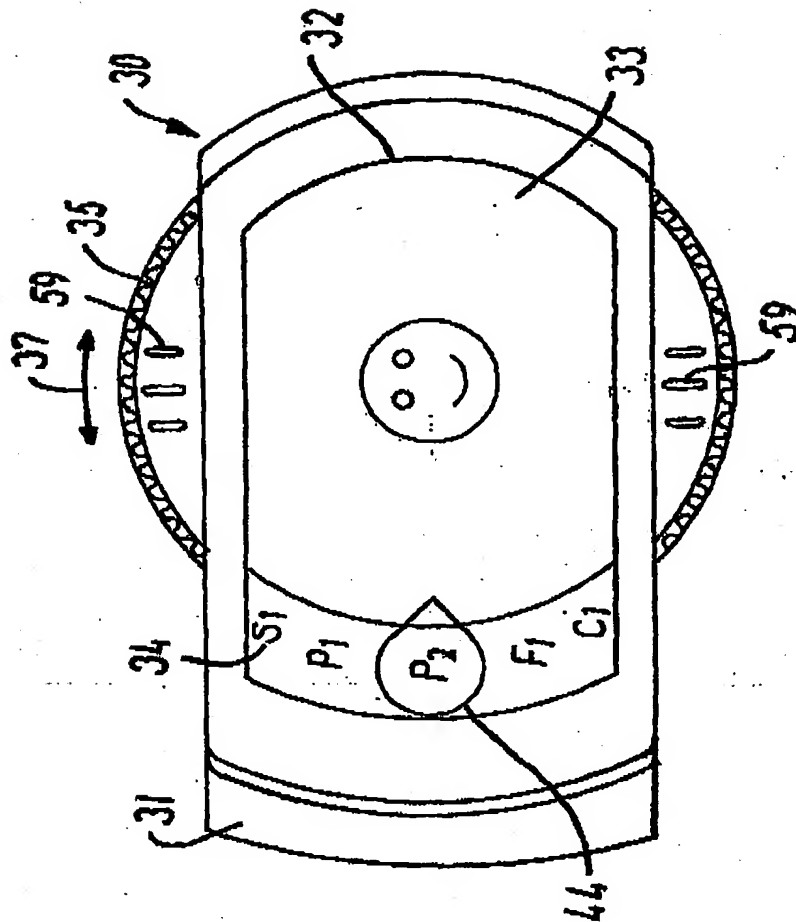


FIG. 2

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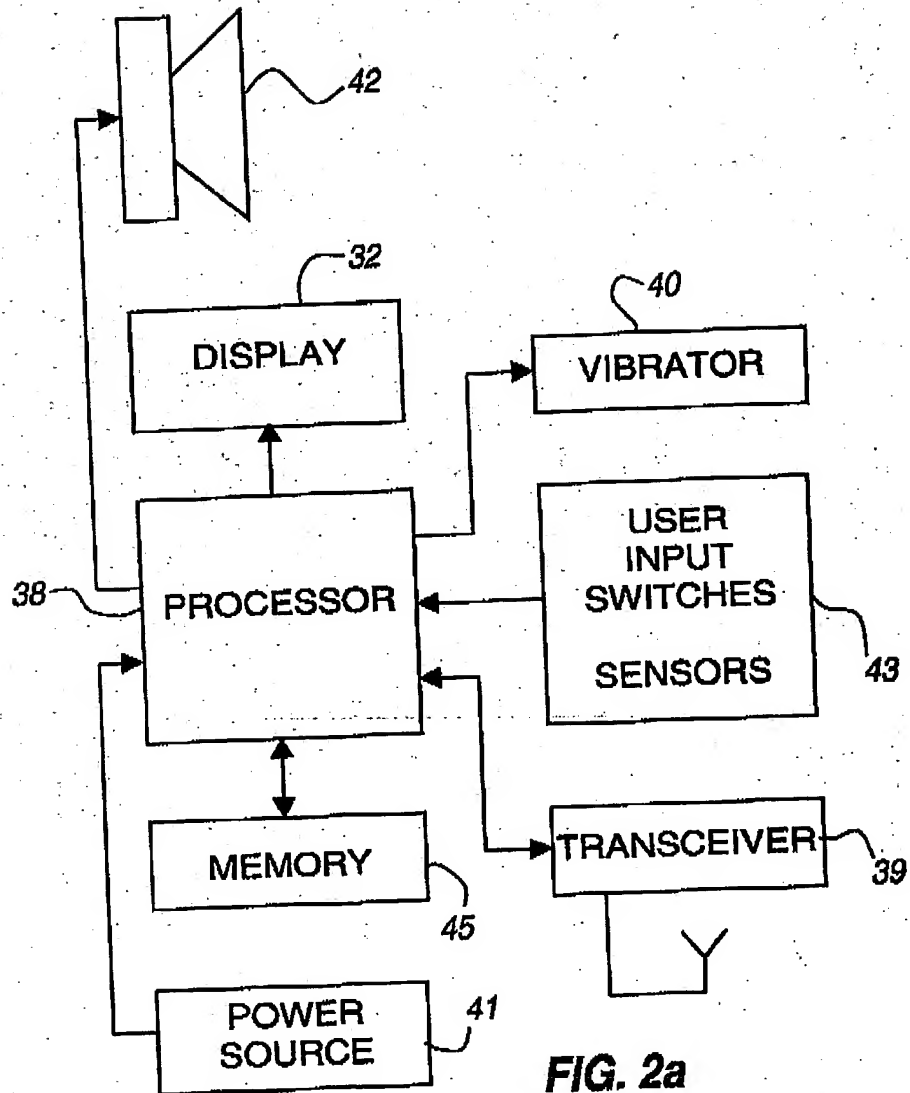


FIG. 2a

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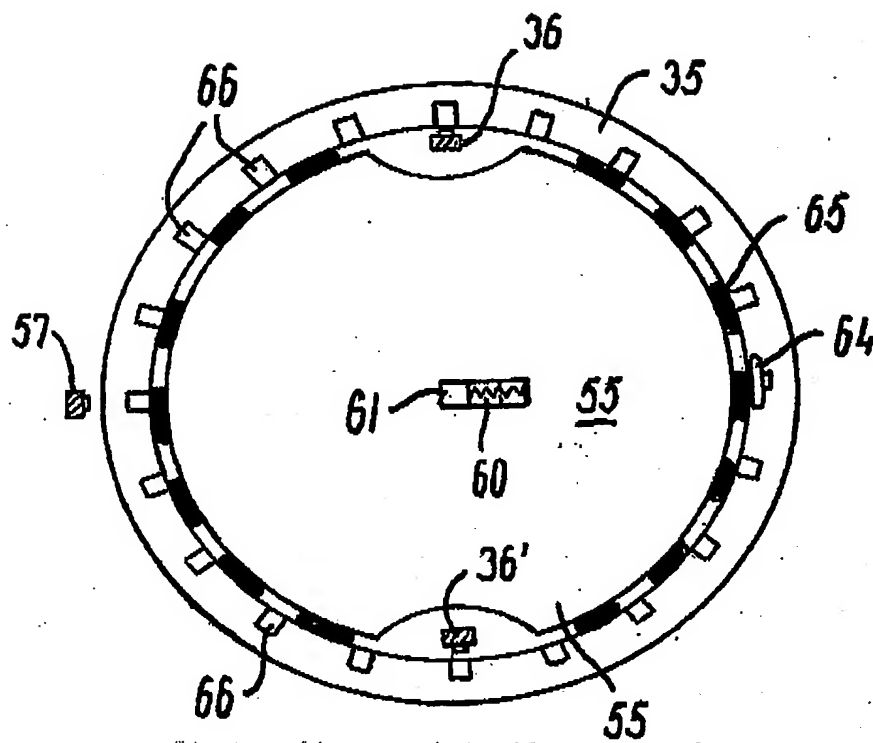


FIG. 2b

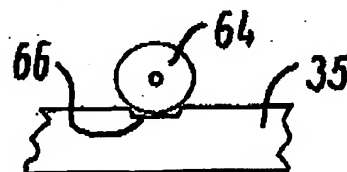


FIG. 2c

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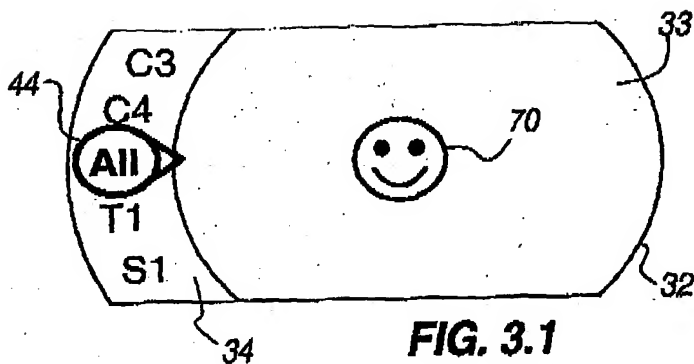


FIG. 3.1

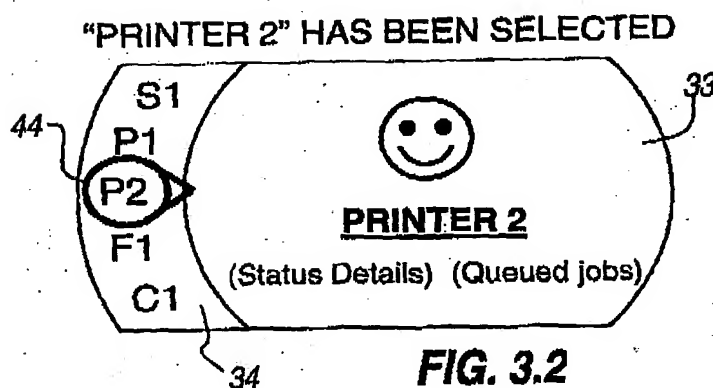


FIG. 3.2

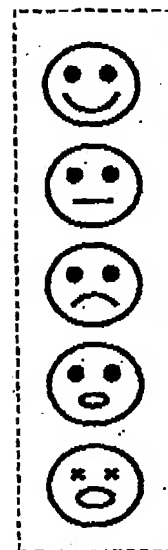


FIG. 6

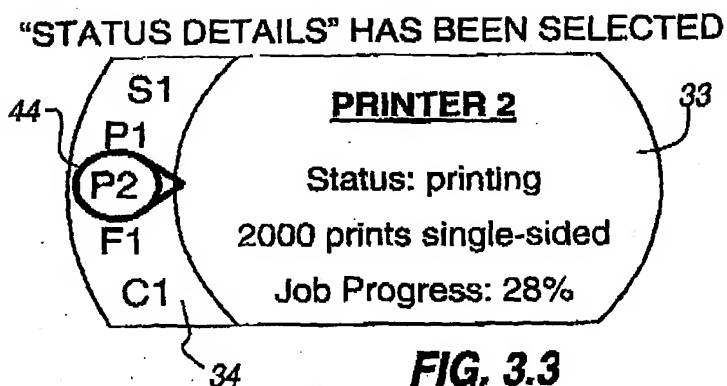
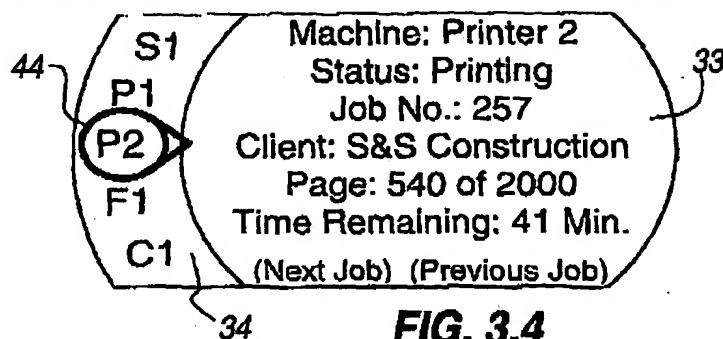
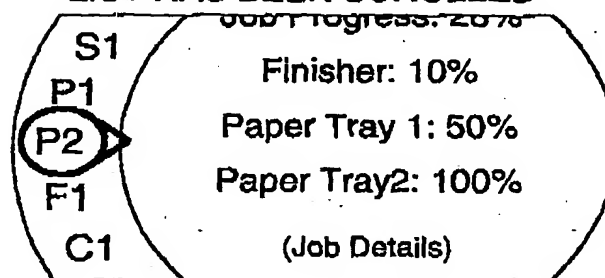
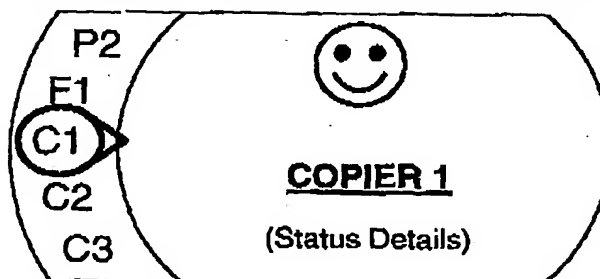


FIG. 3.3

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"QUEUED JOBS" HAS BEEN SELECTED**FIG. 3.4****LIST HAS BEEN SCROLLED****FIG. 3.5****"COPIER 1" HAS BEEN SELECTED****FIG. 3.6**

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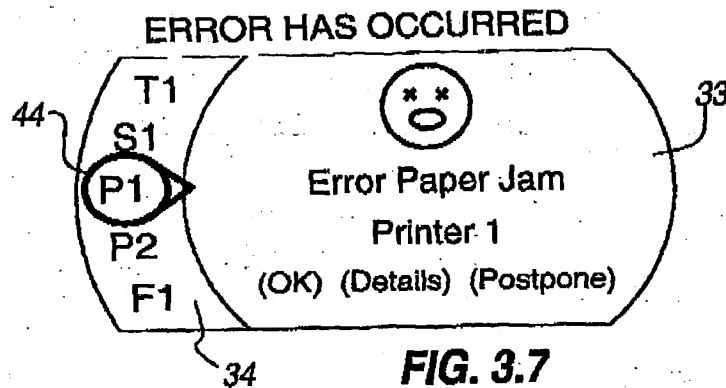


FIG. 3.7

"DETAILS" HAS BEEN SELECTED

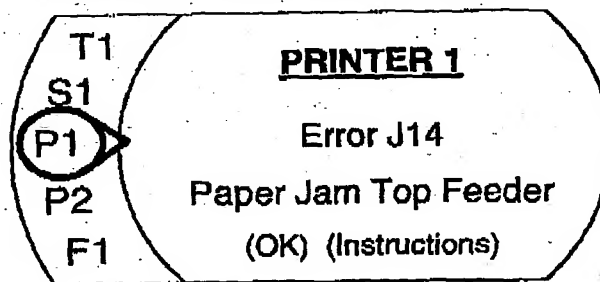


FIG. 3.8

"INSTRUCTIONS" HAS BEEN SELECTED

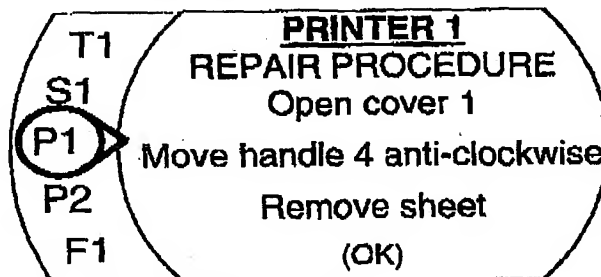


FIG. 3.9

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"POSTPONE" HAS BEEN SELECTED AND CONFIRMED

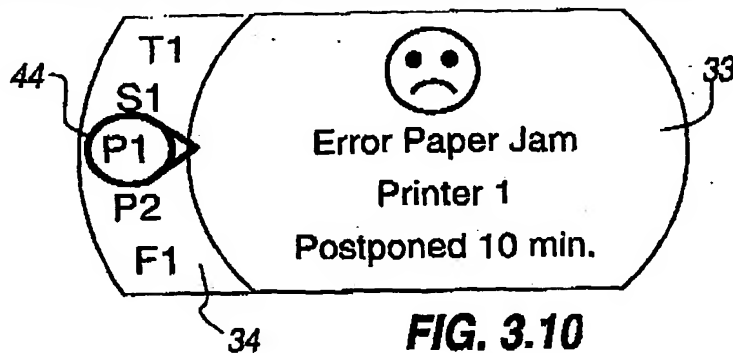


FIG. 3.10

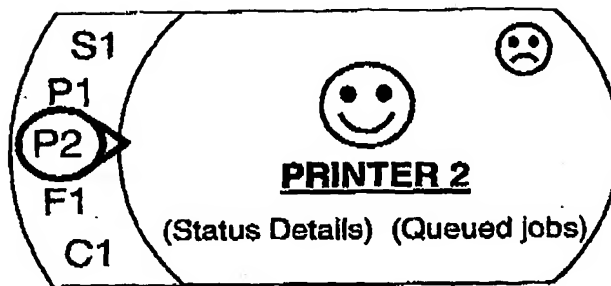


FIG. 3.11

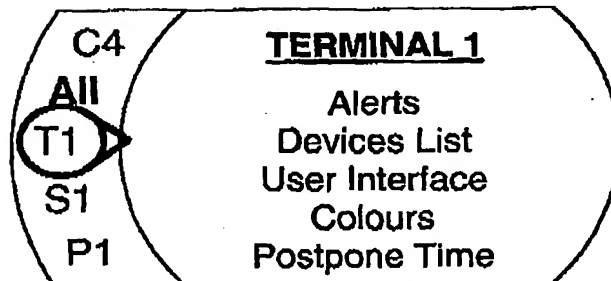


FIG. 3.12

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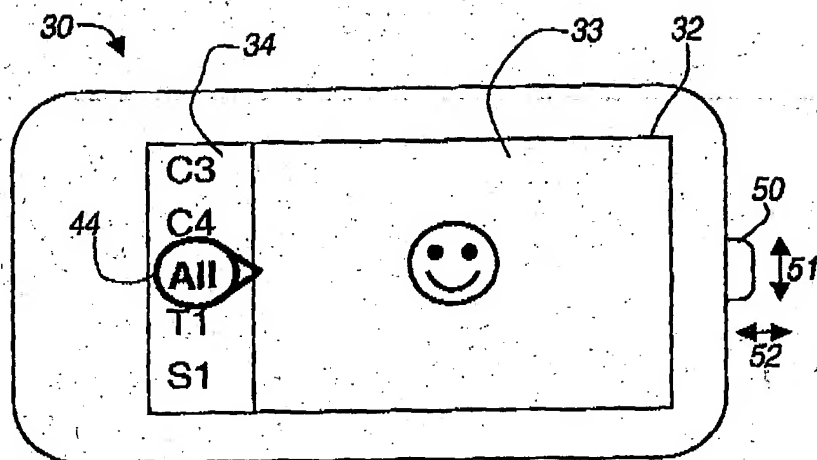


FIG. 5

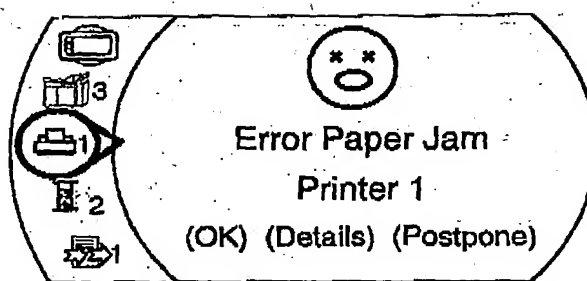


FIG. 5